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English Translation for Description of FIG. 1.

In FIG. 1, Y-shaped optical waveguide path (2) is formed on a glass substrate (1). The optical waveguide path (2) comprises a base section (3) and branching section (4 and 5) which branch at an equal angle therefrom. The optical waveguide path (2) is manufactured by diffusing a silver. That is, an anti-diffusing layer made from a vaporized aluminum is formed on the base plate (1) by a lift-off method excluding an area which is supposed to be the optical waveguide path (2). After that, a silver layer is vaporized on the area which is supposed to be the optical waveguide path (2) and the anti-diffusion layer so as to diffuse a sylver in the base plate (1) by electric-field-diffusing-method. A sylver is diffused only in an area which is supposed to be the optical waveguide path (2). Finally, the anti-diffusion layer is removed.

On a branching section of a Y-shaped optical waveguide path (2), a diamond-shaped heating electrode (6) and heating-electrodes (7 and 8) are formed closely each other in a region which is near the base section (3) and a regioin which is near the branching sections (4 and 5). Electrodes (6, 7, and 8) are manufactured by vaporizing Ni-Cr member or Ti member. These heating electrodes (6, 7, and 8) are independent each other and controlled separately by an electric circuit (9). Voltage which is applied to the heating electrodes may be alternate current or direct current. When heat occurs at the heating electrodes when

an electric current goes through the heating electrodes, temperature in an area under which the optical waveguide path is formed increases. Thus, refractive index increases. If the optical waveguide path is made of a soda glass, refractive index alters 10^{-3} in a range of 0 to 100℃ of temperature in maximum.

When none of heating electrodes (6, 7, and 8) is not generating heat, a light which is transmitted in the base section (3) goes separated in two directions into branching sections (4 and 5) as shown in FIG. 2. When two heating electrodes (6 and 7) generate heat by an electric power supply (9), the refractive index of the optical waveguide which is disposed under the electrodes (6 and 7) increase. Therefore, the light which comes through the base section (3)goes only to a branching section (4) after going through the optical waveguide having high refractive index as shown in FIG. 3. The refractive index in the branching section (5) is higher than that of the heating electrodes (6 and 7); thus, the light does not leak to the branching section (5). When heating electrodes (6 and 8) generate heat by the electric power supply (9), the refractive index of the optical waveguide path which are disposed under the electrodes (6 and 8) increase. Thus, the light is transmitted to the branching section (5). Also, the light does not leak to the branching section (4). By switching the heating-electrodes, it is possible to obtain an optical switching operation.